

isotherm, modified by extreme winter temperatures. This still leaves out some areas that I think of as "Arctic" such as James Bay and its Polar Bears and the northwest coast of Alaska with Belugas and Yellow-billed Loons. This, perhaps, proves that nature will never entirely fit into our human need for definitions.

Following his definition, the author then chose the species to be included as arctic birds and mammals. Here I am a little perplexed. He has, for example included Carrion Crow but not Black-billed Magpie (which I have seen at 63°N). He has only an introductory mention of the Gray Jay, which ranges to the shores of the Arctic ocean. Tree Swallow is given an individual account while the more northerly Cliff Swallow (I have seen it at 73°N) is merely mentioned as a rarity. I am also confused by the species he has decided to split and those he leaves as sub-species. For, example he has Iceland and Thayer's gulls as separate species but not Mew and Common gulls. There seems to be better evidence to split the latter. Similarly you can question having separate entries for Black and Common scoters.

These are minor points and not as significant to my two major concerns. The species descriptions are detailed and clear and are some of the best I have read. While they are first rate, the author gives exceedingly spartan information on confusing species. This is in contrast to the descriptions, which often allude to an important field mark. For example, he states the three central tail feathers of the jaegers are "distinctive." In the field separating a Parasitic Jaeger with a 9 cm tail extension from a Long-tailed with a 12 cm extension is not that easy. I well remember a controversial bird

that needed the late great Earl Godfrey's talents to resolve as a Long-tailed Jaeger. Similarly the information on the Common and Hoary redpolls is not enough for field separation. There is no mention, for example, of the stubby bill of the Hoary – very evident in the nice accompanying photo.

My second point is that this is not a complete guide to wildlife. Unlike such books as Les Beletsky and Dennis Paulson's *Ecotraveller's Wildlife Guide to Alaska* it does not contain any information on plants, insects, marine invertebrates and fish or amphibians. Admittedly Beletsky only includes the commoner, more visible species although his title does say it is a complete guide, but he does include a broad spectrum of the wildlife, other than birds and mammals, visible to the naked eye.

While this is not meant as a coffee table book the photographs are really eye-catching. The bird plates are quite good, but I was less taken with the mammal plates. My chief reservation about all these illustrations is they frequently show only adult males.

I will take this book with me on my upcoming trip to the Pribilof Islands. For the most part I will be seeing wildlife that I am familiar with and I will not carry a conventional field guide to the birds or mammals. This book will provide me with more encyclopaedia-style information about the creatures I am seeing. I will also take Beletsky and Paulsen's book and a flower guide.

ROY JOHN

2193 Emard Crescent, Beacon Hill North, Ottawa, Ontario
K1J 6K5 Canada

The Black Flies (Simuliidae) of North America

By P. Adler, D. Currie, and D. Monty Wood. 2004. Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario M5S 2C6 Canada, and Cornell University Press. 941 pages. \$99.95 US.

This is a huge book. It is huge in size, filling 941 pages. It is huge in scope, treating the biology, management and identification of the entire black fly fauna of Canada, the United States, and Greenland. And it is huge intellectually, the culmination of many decades of work by an enthusiastic international community of researchers, among whom the authors of this book are prominent members.

In the preface, Peter Adler states that the book is "geared to a general readership." I would not have guessed that this was true, at first glance, but after some perusal it seemed to me that the book would be useful from about the undergraduate level on up. The writing is clear and precise, but the vocabulary will be daunting for most people without biological training. I suspect that the book will find a place in almost all scholarly libraries, and that the specialists who will use it most probably ordered a copy before it came into print. But there is a wider audience for the book as well, and in

this regard I predict that it will be a required reference for many decades to come. The authors mention its relevance to medical and veterinary entomologists, aquatic biologists, environmental consultants, systematists, naturalists, pest management specialists and students, but I suspect the real list will be longer than that.

The text is arranged in four parts, covering background information, biology of black flies, economic concerns, and systematics and taxonomy. The first part provides an overview of the subject, a very readable history of the study of black flies (with lovely historical photographs) and a chapter on techniques for collecting and curating black fly specimens. As an entomologist (with no particular interest in black flies, I'll admit) I nonetheless found this section very interesting.

The second part of the book deals with the biology of black flies, and consists of a fine treatment of the structure of these insects (and their immature stages), as well as a well-written overview of their cytology. Black fly cytology was pioneered by the late Klaus Rothfels, a man deeply missed by the authors, and who they refer to as "friend, mentor, and phenomenon." A chapter summarizing the life history and behaviour

of black flies is also offered, along with an exhaustive summary of blood feeding host records, and records of black fly diseases and parasites.

For most readers, it is likely that the third part of the book, which treats the management of black fly pests, will be the most interesting. I can see this part of the book providing fodder for any number of term papers, research paper introductions, and consulting and government reports. I was surprised, however, to find that the chapter on management (Chapter 8) was largely historical in nature, without a summary of control recommendations. On careful reading, however, I could see the reason for this approach. Oil-based pesticides, DDT, and other chemical controls for black flies have not stood the test of time. The authors summarize the use of the bacterial toxin *Bti*, but give it only a qualified nod, with the caution that it too might lose its effectiveness over time. The chapter ends in an interesting discussion of repellants, and repellant clothing.

The fourth and final part of the book is clearly the section closest to the authors' own interests. It treats the 254 species of "North American" black flies, thoroughly. The focus is not simply on identification, it is also deeply phylogenetic, and includes a very careful evolutionary justification for each and every level of the classification. This is followed by a superb species by species treatment of the entire fauna. Significantly, there is additional information on the economic significance (if any) of each and every species, adding greatly to the summary in part three of the book.

As a non-specialist, I have to admit that the most impressive aspects of the book to me were the illus-

trations. They begin on page 436 (well before the halfway mark) and they are so masterfully executed that I couldn't help but come away thinking that there was something deeply beautiful and elegant about black flies, their larvae and pupae, and the fine details of their anatomy. More full-body illustrations of the adults would have been nice, but the overall sameness of the other life stages illustrated convinced me that side-by-side comparisons of the adults might not be all that useful. Maps follow the illustrations, and treat the United States and Canada on a county level, but they do not show Greenland. And, as one might expect in a book of this nature, the reference section and the indices are exhaustive.

This is a *magnum opus*, and a tremendous labour of love. It ranks, in my opinion, right up there with Holldobler and Wilson's *The Ants*. Having said that, it seems to me a shame that the book appears to have been presented as a somewhat impenetrable scholarly tome, without a showy slip cover, and with little or no fanfare for the "general readership" to which it was addressed. Don't be scared off by the size, or the complexity of this book. It is a masterwork, and if any aspect of your interests overlaps with the subject of black fly biology, do consider adding this fine volume to your library.

JOHN ACORN

University of Alberta, Edmonton, Alberta T5T 5L7 Canada

Literature Cited:

Hölldobler, Bert, and E. O. Wilson. 1990. *The ants*. Belknap Press (Harvard University Press), Cambridge, Massachusetts. 732 pages.

Insects: Their Natural History and Diversity: With a Photographic Guide to Insects of Eastern North America

By Stephen A. Marshall. 2006. Firefly Books Ltd., 66 Leek Crescent, Richmond Hill, Ontario L4B 1H1 Canada. 720 pages. CDN \$95. Hardcover

It has always been said that you can't judge a book by its cover, but after reading *Insects: Their Natural History and Diversity* I've learned that this well-worn idiom isn't always true. When this book first crossed my desk, to say that I was instantly enamoured would be an understatement. It was so beautiful, the cover adorned with a stunning jewel-toned dogbane beetle (*Chrysochus auratus*). I almost didn't want to crack the binding. However, my curiosity finally got the better of me and I'm glad it did because once I started reading I couldn't put the book down.

Visually stunning, with over 4000 colour photographs of insects in their natural habitats, *Insects: Their Natural History and Diversity* has the look and feel of a glossy coffee table book while still being full of accurate, well researched information.

As its title implies, *Insects: Their Natural History and Diversity* focuses on the diversity and natural history of common families of northeastern North American insects. The book opens with a brief synopsis of basic insect anatomy and morphology. This is followed by chapters covering the diversity of all insect orders, including all the major families, along with two chapters on non-insect arthropods and methods for observing, collecting and photographing insects. The book's last 50 pages are dedicated to illustrated keys to order and family as well as a key to the most commonly encountered insect larvae. These keys are designed to facilitate ease of use and therefore emphasize morphological characters visible to the naked eye or easily seen with a hand lens. Also peppered throughout the book are helpful suggestions on where to look for and find various insect orders/families. For example, "Depending on your inclination and the weather, a good place to start looking for assassin bugs would be in your kitchen light fixture. Unless you are much more